

REMARKS

Claims 77-96 are pending in the present application.

Claim 85 was amended.

Reconsideration of the claims is respectfully requested.

35 U.S.C. § 112, First Paragraph (Written Description)

Claim 85 was rejected under 35 U.S.C. § 112, first paragraph, as failing to describe the invention in such a way as to reasonably convey to one skilled in the art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection is respectfully traversed.

Claim 85 has been amended to correct the error identified in the Office Action.

Therefore, the rejection of claim 85 under 35 U.S.C. § 112, first paragraph has been overcome.

35 U.S.C. § 103 (Obviousness)

Claims 77-96 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,422,289 to *Pierce et al* in view of U.S. Patent No. 5,346,587 to *Doan et al*. This rejection is respectfully traversed.

As previously noted, independent claim 77 recites that the source and drain regions each include a first portion in the substrate and a second portion on the substrate over the first portion and adjacent to the insulating material on the sides of the gate electrode. Similarly, independent

claim 90 recites that doped regions within the substrate and doped semiconductor material on the substrate form a source and drain for a transistor, while independent claim 96 recites that doped source and drain regions extend into the substrate and within semiconductor material on the substrate.

Pierce et al discloses in Figure 5 a structure in which the source and drain regions 34 and 36 are completely within the substrate, with conductive contacts or plugs 38 and 40 over the source and drain regions 34 and 36 are provided for electrically contacting source and drain regions 34 and 36. *Pierce et al* teaches that these conductive plugs 38 and 40 may be formed from polysilicon or single crystal silicon doped in situ. *Pierce et al*, column 11, lines 29–46.

The Office Action asserts that the conductive plugs are indistinguishable from the recited source drain regions since:

[N]ormally both a source/drain and a contact region are heavily doped. It is not possible to make silicon a conductor no matter how many dopants are added. Silicon will always have a lower conductance than a metallic material.

Paper No. 20, page 3. However, as reflected by the attachments, the resistivity of silicon when doped to sufficiently high impurity concentrations drops to the order of 10^{-4} Ω -cm (100 $\mu\Omega$ -cm) or less, comparable to the resistivity of at least some metals, including some frequently used in semiconductor device fabrication such as titanium (54 $\mu\Omega$ -cm).

More significantly, *Pierce et al* teaches the conductive plugs to each be a conductor (even if formed of doped semiconductor material), NOT a semiconductor suitable for functioning as

source/drain regions. For this reason, the proposed combination of references do not satisfy every limitation of the claims.

Claims 87 and 90 recite that the LDD source/drain regions are the first portions of the source and drain, formed within the substrate, as distinct from the second portion. Such a feature is not shown or suggested by the cited references.

Claim 88 recites that the second portions (over the substrate) of the source/drain regions are doped to form heavily doped portions, while claim 91 adds that the first portions (in the substrate) are lightly doped. Such a combination of features is not shown or suggested by the cited references.

Therefore, the rejection of claim 77-96 under 35 U.S.C. § 103 has been overcome.

AMENDMENTS WITH MARKINGS TO SHOW CHANGES MADE

Claim 85 was amended herein as follows:

- 1 85. (twice amended) The integrated circuit structure of claim 77, wherein the first and second
2 portions of the source and drain regions are both formed of a semiconductor material doped to
3 include lightly doped regions within at least the first portions and heavily doped regions within
4 at least the second portions.

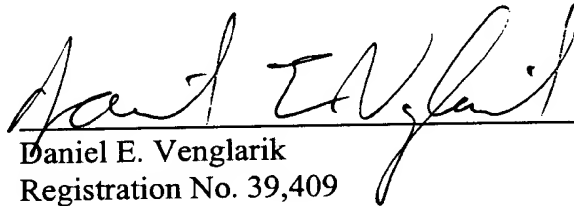
If any issues arise, or if the Examiner has any suggestions for expediting allowance of this Application, the Applicant respectfully invites the Examiner to contact the undersigned at the telephone number indicated below or at *dvenglarik@novakov.com*.

The Commissioner is hereby authorized to charge any additional fees connected with this communication or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

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